

REMARKS

Claims 1-4 are all the claims pending in the application.

Claims 1-3 are rejected.

Claim 4 is objected to.

The abstract of the disclosure is objected to because it contains two paragraphs.

Claims 1-3 are rejected under 35 U.S.C. 102(b) as being anticipated by Saito (U.S. Patent No. 5,477,117).

Claim 4 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The Applicants traverse the rejections and request reconsideration.

Specification

A Substitute Specification and a redlined version are attached with changes to overcome the various informalities. No new matter is added.

Claim Rejections Under 35 U.S.C. § 102

Rejection of Claims 1-3 based on Saito

The present invention is directed to synchronization of two-axis motion control. Specifically, such motion control is important for gantry type machines used in industrial settings. This is particularly so when the machines are low in rigidity and have torsion or backlash. Problems in the related art include inability to obtain high gain, installation errors and

axes interfering with each other during control operations. Therefore, twin synchronization becomes important.

In the exemplary embodiment described in relation to Fig. 3, at step 1, a first axis is controlled allowing the second axis to freely run and get reset to zero. In step 2, the deviation between the axes is measured at an arbitrary pitch. In step 3 a torsion function is generated that correlates the traveling position and the deviation between the axes. This function is stored in a database.

Claim 1 requires operating one of the two axes at low speed by a position control and allowing the other axis to freely run and follow the one axis and perform a return to the origin. Further, a positional deviation between the one axis and the other axis is measured at an arbitrary pitch. The positional deviation corresponding to a position where the one axis travels is represented as a function and stored in a data base. One position command is provided to the one axis as a main position command. The position command to the other axis is provided as a position command corrected by using the function.

Saito is directed to numerical control (NC) machining. The Examiner merely points out to components in Saito without clearly showing where each step in the method claim is disclosed. For example, the Examiner contends that in Saito, the second axis Y is allowed to follow the first axis X. Even if this is correct and Saito in fact discloses what the Examiner alleges it does, this has little relevance to the present invention. Specifically, claim 1 requires operating **one axis at low speed by position control** and allowing the other axis to **run freely and follow the one axis and return to the origin**.

Further, the Examiner contends that Saito discloses measuring the position of both motors and sending the position feedback to the processor. However, claim 1 requires measuring the **positional deviation between the one axis and the other axis** at an arbitrary pitch. Saito does not disclose measuring the deviation between the axis. Importantly, Saito does not generate and store a function correlating the positional deviation corresponding to a position where the one axis travels. The Examiner contends merely that the position information is stored in the processor. This is very different from the above described function which is subsequently used to correct a position command for the second axis. No such correction is performed in Saito.

Importantly, Saito does not disclose (or even remotely suggest) twin axis synchronization as in the present invention.

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." MPEP 2131 *citing Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The Examiner has not established anticipation of the present invention by Saito at least because of the several differences noted above between the present invention and the teachings of Saito.

Claims 2-3 are dependent on claim 1 and are allowable at least for the same reasons.

Allowable Subject Matter

The Examiner is requested to hold the status of the allowable claims in abeyance pending resolution of the status of the base claims.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the

Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



Chid S. Iyer
Registration No. 43,355

SUGHRUE MION, PLLC
Telephone: (202) 293-7060
Facsimile: (202) 293-7860

WASHINGTON DC SUGHRUE/265550

65565

CUSTOMER NUMBER

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